QH
1
B4X
NH

. 57, pp. 653–666 24 January 1977

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ISOPOD CRUSTACEANS (EXCEPT ANTHURIDAE) COLLECTED ON THE PRESIDENTIAL CRUISE OF 1938

By Thomas E. Bowman
Department of Invertebrate Zoology,
Smithsonian Institution,
Washington, D.C. 20560

The isopods reported on herein were collected during an inspection cruise and fishing trip aboard the U.S.S. *Houston* in July and August of 1938 by President Franklin D. Roosevelt. Dr. Waldo L. Schmitt served as Naturalist during the cruise. From San Diego, the *Houston* sailed south along Lower California, then visited Socorro Island in the Revilla Gigedo Islands, stopped at Clipperton Island, and then headed south to the Galapagos Islands. Returning from the Galapagos, stops were made at Cocos Island, and after passing thru the Panama Canal, at Old Providence Island, in the Caribbean Sea east of Nicaragua. Further details of the cruise are given by Schmitt (1939). Isopods were obtained at all the above localities except the Galapagos.

Schmitt (1939: 7, footnote 4) stated that reports on the Presidential Cruise amphipods and isopods were being prepared by Clarence R. Shoemaker and James O. Maloney, respectively. The report on the amphipods appeared in due course (Shoemaker, 1942). Maloney compiled a preliminary list of the isopods, but a final manuscript was not completed before he left the Smithsonian Institution in 1945.

Cirolanidae

Cirolana parva Hansen
Figures 1–3

Cirolana parva Hansen, 1890: 340–341, pl. 2., fig. 6, 6b, pl. 3, fig. 1–1d. —Richardson, 1900: 217; 1905: 111–114, figs. 93–95; 1912: 187.—

Moore, 1901: 167, pl. 8, figs. 6–8.—Stebbing, 1905: 12; 1910: 217.—Nobili, 1907: 421.—Barnard, 1914: 353a.—Chilton, 1924: 883–884, fig. 5; 1926: 180.—Monod, 1931: 3; 1933: 173; 1937: 15.—Nierstrasz, 1931: 151.—Edmondson, 1951: 192–194, fig. 4a–g.—Menzies and Frankenberg, 1966: 51, fig. 27.—Menzies and Glynn, 1968: 38–39, fig. 14C–D.—Miller, 1968: 15–16, fig. 4.—Schultz, 1969: 185.—Jones, 1976: 216–217.

Cirolana diminuta Menzies, 1962: 343–344, fig. 6A–F.—Schultz, 1969: 184, fig. 288.

Station 30–38, Old Providence Island, 6 Aug. 1939, shore, reef, and tidepool collecting: 1 specimen, 6.5 mm.

The characteristic form and armature of the telson and uropods, shown by Hansen (1890), Richardson (1905), Menzies and Frankenberg (1966), and Menzies and Glynn (1968) serves to identify the species. The rather broad frontal lamina and short clypeus (Fig. 1) are also helpful characters. Pereopod 1, not illustrated heretofore, is figured here (Fig. 2); as in *C. anadema* Glynn (1972) the merus is armed with a series of blunt spines on the opposable margin.

Distribution: Throughout the Caribbean, Gulf of Mexico, Florida, Bahamas, north to Georgia (31°32'N); west coast of Africa (Monod, 1931); Pacific coast of Mexico (Menzies, 1962); Hawaii (Edmondson, 1951); South Pacific; Indonesia; Indian Ocean ("This species is the commonest *Cirolana* in the Indian Ocean region."—Jones, 1976); Red Sea and Suez Canal.

Eurydice caudata Richardson

Figures 4–18, 34

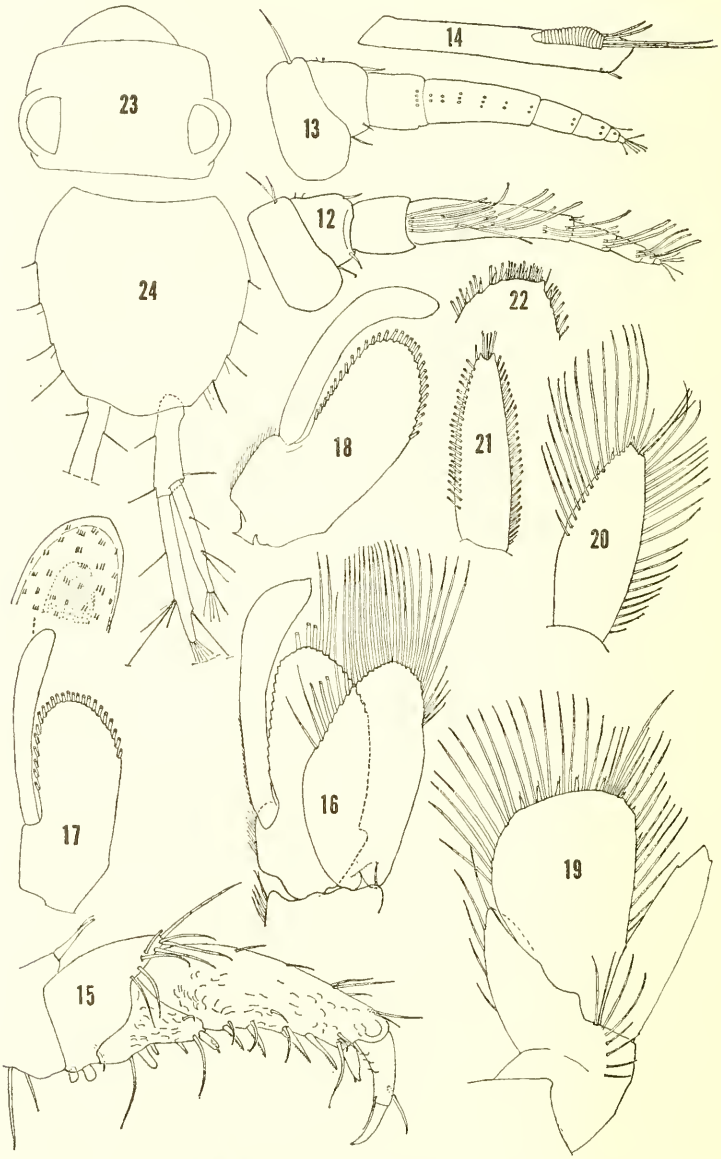
Eurydice caudata Richardson, 1900: 217–218, fig. 3; 1901: 516; 1905: 124, fig. 107.—Steinbeck and Ricketts, 1941: 424.—Schultz, 1969: 173, fig. 265.

Eurydice branchuropus Menzies and Barnard, 1959: 32, figs. 26–27.—Schultz, 1966: 14; 1969: 173, fig. 266.

Station 28–38, Cocos Island, Chatham Bay, 3 August 1938, from bottom sample, mostly sand, depth 55 m: 2 mancas (pereopod 7 undeveloped), 2.05 and 1.85 m.

This species has never been adequately described and illustrated. Since the Presidential Cruise specimens are very immature, some of the principal characters of the species are illustrated from a male syntype, 6.4 mm in length. Apical margin of telson about 0.4 greatest width of telson, delimited by pair of teeth; 4 spines on margin, central pair more widely spaced than others. Uropods not quite reaching apex of telson; each ramus with pair of spines at distolateral corner. Antenna 1, 4th segment elongate. Appendix masculina of pleopod 2 inserted slightly distal to proximal ¼ of medial margin of endopod; apex bent laterally, broadening and ending in point.

Figs. 1–3. *Cirolana parva*: 1, Head, ventral; 2, Pereopod 1; 3, Pereopod 2. Fig. 4–10, *Eurydice caudata*: 4, Pereonites 5–7 and pleon, lateral, ♂ syntype; 5, Telson and uropods of same; 6, Telson and uropod, 5.4 mm ♂ from Clarion I.; 7–10, Apical margin of telson: 7, 2.05 mm manca, Cocos I.; 8, 4.5 mm ♂, La Libertad, Ecuador; 9, 1.85 mm manca, Cocos I.; 10, 4.5 mm ♀, Isabella I.; 11, Antenna 2, 5.4 mm ♂, Clarion I.



Figs. 12–18. *Eurydice caudata*: 12, Antenna 1, ♂ syntype; 13, Antenna 1, ♂, Clarion I. (circles show insertions of esthetes); 14, Antenna 2, flagellar segment 14, ♂, Clarion I.; 15, Pereopod 1, ♂, Clarion I.; 16, Pleopod 2, ♂ syntype; 17, Pleopod 2 endopod, ♂, Clarion I.; 18, Pleopod

The range extension provided by the Presidential Cruise specimens is considerable, since *E. caudata* has heretofore been reported only from Catalina Island, California (type-locality), the Gulf of California (Steinbeck and Ricketts, 1941) and coastal waters of southern California and nearby Lower California (Menzies and Barnard, 1959; Schultz, 1966). The USNM collections include samples of *E. caudata* that document its wide distribution (Fig. 34). North of the type-locality it has been collected at San Clemente Island and off Point Vicente. Farther south, it has been found at 2 of the Revilla Gigedo Islands, Socorro Island and Clarion Island, and at Isla Isabella (ca. 50 km NE of Tres Marias Is.). The southernmost record in the Northern Hemisphere is the Cocos Island sample of the Presidential Cruise, but there is one USNM sample from La Libertad, Ecuador (2°14'S).

Eurydice branchuropus was described from southern California by Menzies and Barnard (1959), but reduced to a synonym of the Atlantic *Eurydice littoralis* (Moore), by Menzies and Glynn (1968). However, as clearly shown by Menzies and Glynn (1968: fig. 4B) and by Moreira (1972: fig. 25), *E. littoralis* differs in having the inner pair of spines on the apical margin of the telson much longer than the outer pair. In *E. branchuropus*, as in *E. caudata*, the 4 apical spines are subequal. I consider *E. branchuropus* a synonym of *E. caudata*. Menzies and Barnard separated their species from *E. caudata* by its shorter 1st antenna and rounded uropodal rami. The difference in antennal length is a secondary sexual character, and as shown herein (Figs. 5–6), the uropodal rami of *E. caudata* are rounded, not truncate as described and illustrated by Richardson.

Excorallanidae

Excorallana tricornis occidentalis Richardson

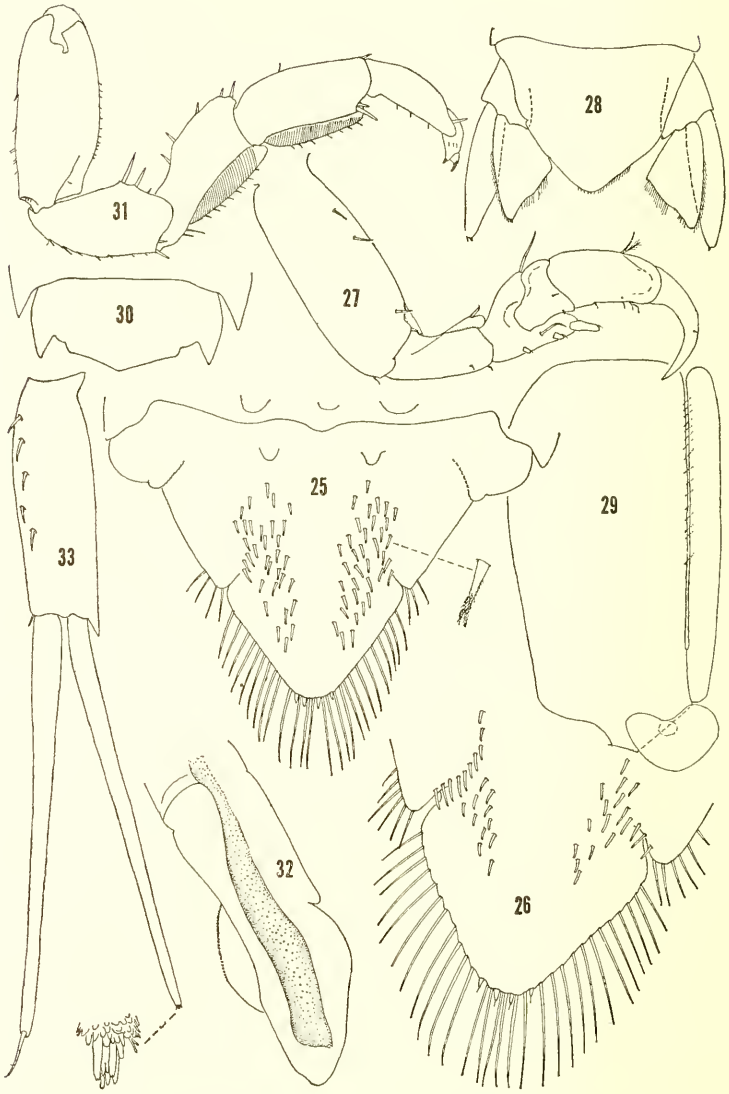
Figures 19–20, 25

Corallana tricornis Hansen, 1890: 379–381 [specimen from El Realejo, Nicaragua, only].
Excorallana tricornis occidentalis Richardson, 1905: 141.
Excorallana tricornis (Hansen).—Steinbeck and Ricketts, 1941: 424.

Off San Jose del Cabo Bay, Lower California (23°02'N, 109°40'W), 19 July 1938.—On body surface and in nostrils of gulf grouper (*Myctero-*

←

2 endopod, ♂, La Libertad, Ecuador. Fig. 19–20, *Excorallana tricornis occidentalis*, Presidential Cruise, 5.1 mm: 19, Left uropod, ventral; 20, Exopod of left uropod. Fig. 21–22, *Excorallana tricornis tricornis*, Dry Tortugas, Fla.: 21, Exopod of left uropod; 22, Apex of endopod of left uropod. 23–24, Unidentified Janiridae, Presidential Cruise: 23, Head, dorsal; 24, Telson and uropods.



Figs. 25–33. *Excorallana tricornis occidentalis*, 6.6 mm ♂, Presidential Cruise, telson; 26, *E. t. tricornis*, Dry Tortugas, Fla., posterior part of telson; 27, *Rocinela signata*, Socorro I., pereopod 1, lateral; 28, *Nerocila californica*, ♂, Magdalena Bay, telson and uropods; 29, Same, pleopod 2. 30–33, *Ligia occidentalis*, ♂, Cedros I.: 30, Telson; 31, Pereopod 1, medial; 32, Apex of appendix masculina, anterior; 33, Right uropod, dorsal.

perca jordani (Jenkins and Evermann), 24 specimens, 3.6–8.6 mm.—From jack-crevally (*Caranx caninus* Gunther), 1 manca.

Richardson (1905) proposed recognition of the subspecies *occidentalis* for 3 specimens of *E. tricornis* from an unspecified locality in the Gulf of California. These syntypic specimens were actually collected at *Albatross* station 2826 (24°12'N, 109°55'W) in the southwestern Gulf, and according to Richardson, ". . . differ from the specimens of the East coast only in having larger tubercles on the abdominal segments on either side of the median longitudinal groove". In the 2 female syntypes there are prominent pairs of tubercles on pleonites 4 and 5 and at the base of the telson. One female has a slightly developed pair of tubercles on pleonite 3. The 6.3 mm male syntype, like the Presidential Cruise specimens, has no large tubercles on the pleonites, but has a moderately well developed pair at the base of the telson. The development of pleonal tubercles on the female syntypes could be related to their greater maturity (both ovigerous, with body lengths of 7.1 and 8.5 mm). Further evidence of variation in pleonal tuberculation is given by a 6.8 mm female from Concepcion Bay, Gulf of California (USNM 86381), which has well developed tubercles only on pleonite 5.

Despite the variability in the character upon which Richardson based her subspecies, *E. t. occidentalis* can be separated by other characters: 1. The margins of the lateral incisions of the telson in *E. t. tricornis* are separated by a gap; in *E. t. occidentalis* they are not (compare Figs. 25 and 26). 2. The uropodal exopod of *E. t. tricornis* is narrower in relation to its length, and the terminal setae are inserted into a nearly symmetrical notch (Fig. 21). In *E. t. occidentalis* this notch is shallower, and its medial wall is much longer than its lateral wall (Fig. 20).

Distribution: Probably throughout the Panamic Province.

Aegidae

Rocinela signata Schioedte and Meinert
Figure 27

Rocinela signata Schioedte and Meinert, 1879: 399–401, pl. 13, fig. 3.—Richardson, 1898: 11 [in key]; 1901: 524; 1905: 209–210, figs. 211–212; 1912: 189–190.—Moore, 1901: 171, pl. 10, fig. 2.—Menzies and Glynn, 1968: 45, fig. 20E–G.—Schultz, 1969: 201, fig. 316.

Rocinela aries Schioedte and Meinert, 1879: 401–403, pl. 13, figs. 7–8.—Richardson, 1898: 11 [in key]; 1899a: 828; 1899b: 170; 1905: 210–211, figs. 213–215; 1914: 362.—Steinbeck and Ricketts, 1941: 425.—Menzies, 1962: 345, fig. 5.—Schultz, 1969: 201, fig. 317.

Off San Jose del Cabo Bay, Lower California, 19 July 1938, from gills of striped pargo, *Hoplopagrus guntheri* Gill, 1 specimen, 7.3 mm.

Station 8–38, Socorro Island, 20 July 1938, dredged from sandy bottom, 13–15 m; 1 specimen, 5.8 mm.

The distinction between the Caribbean *R. signata* and *R. aries*, from the Gulf of California and west coast of Mexico, has long been doubtful,

and I agree with Menzies and Glynn (1968) that they are conspecific. In her key, Richardson (1905) separated them by the propus of pereopods 1–3 being unarmed in *R. signata*, but bearing a single spine in *R. aries*. Menzies and Glynn found a spine on the distal part of the propal margin in Puerto Rican specimens of *R. signata*, and I have found the same spine in specimens from Quintana Roo, Mexico. Richardson erroneously described and illustrated 2 blunt spines on the merus and 1 on the carpus; there are actually 3 spines on the merus and none on the carpus.

Distribution: In the Pacific from San Quintin Bay, Lower California (Menzies, 1962), and the Gulf of California, south to Panama, including Socorro Island. In the Atlantic, widespread in the Gulf of Mexico and Caribbean Sea, south to Recife, Brazil (Schioedte and Meinert, 1879).

Cymothoidae

Nerocila californica Schioedte and Meinert
Figures 28–29

Nerocila california Schioedte and Meinert.—Richardson, 1905: 221–223, figs. 224–226 [synonymy].—Schultz, 1969: 151, fig. 224.

Magdalena Bay, Lower California, from broomtail grouper, *Mycteroperca xenarcha* Jordan, 18 July 1938, 1 ♂, 12.0 mm.

The specimen still has the plumose setae on the telson and uropods characteristic of the juvenile pelagic stage. The endopod of pleopod 2, with its appendix masculina, is illustrated here.

Distribution: Southern California to Panama.

Janiridae

Genus and Species undetermined
Figures 23–24

Station 30–38, Old Providence Island, 6 August 1938, shore, reef, and tidepool collecting: 1 specimen, in poor condition, 1.7 mm.

As Menzies and Glynn (1968) pointed out, ". . . the genera *Janiropsis*, *Janira*, and *Bagatus* are indistinguishable from each other except for the characteristics of the male gnathopod." The present specimen is a female, and I cannot identify it beyond the family level.

Ligiidae

Ligia (*Megaligia*) *occidentalis* Dana
Figures 30–33

Ligia (*Megaligia*) *occidentalis* Dana.—Van Name, 1936: 50–51, figs. 5g, 9 [synonymy].

Ligyda occidentalis (Dana).—Steinbeck and Ricketts, 1941: 425.

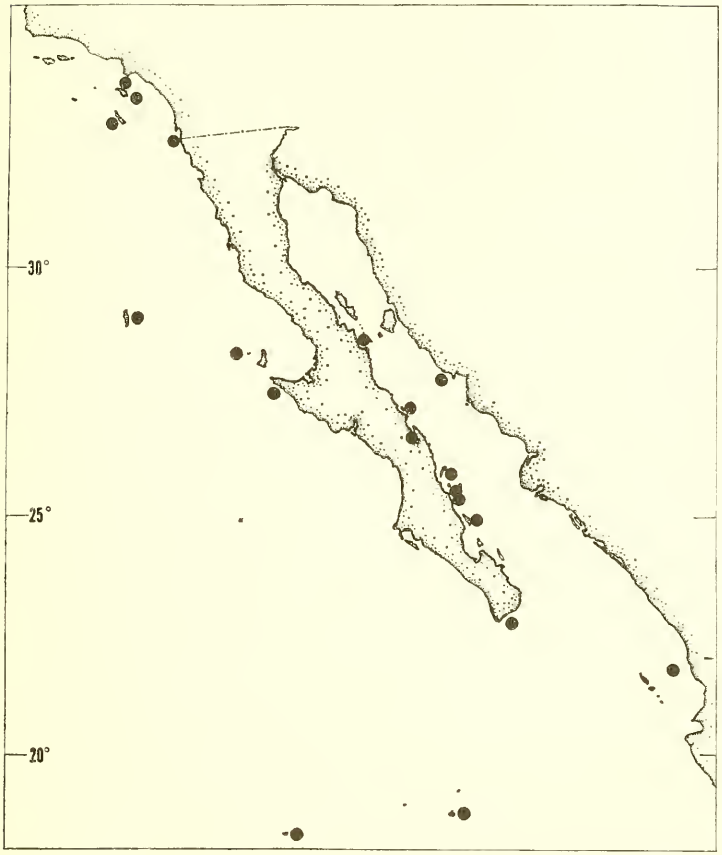


Fig. 34. Known distribution of *Eurydice caudata*. The southernmost record, La Libertad, Ecuador, is not included.

Ligia occidentalis Dana.—Mulaik, 1960: 95, pl. 2, fig. 20.—Brusca, 1973: 207–208, fig. 7.21.

Station 1–38, Cedros Island, Lower California, 17 July 1938, shore collecting north and south of cannery, east side of island: 150 specimens.

Distribution: From San Fransisco Bay to Lower California and the Gulf of California. Brusca (1973) stated that it is probably the most common isopod in the intertidal zone of the Gulf of California. The southern limit is not known; specimens in the USNM from Tres Marias Islands, Mexico, may be the most southern record to date.

Trichoniscidae

Trichorhina heterophthalma Lemos de Castro

Trichorhina heterophthalma Lemos de Castro, 1964: 1–7, figs. 1–2.

Station 14–38, Clipperton Island, 21 July 1938, from 2 booby nests on lagoon shore back of landing: 4 specimens, 2.7–3.2 mm.

For identification of these specimens I am grateful to Dr. George A. Schultz.

Distribution: Known only from the type-locality, Cueva Grande, Punta Caguanes, Yaguajay, Las Villas Province, Cuba (Lemos de Castro, 1964).

Oniscidae

Philoscia richardsonae Holmes and Gray

Philoscia richardsonae Holmes and Gray.—Mulaik, 1960: 158, pl. 11, figs. 217–223.

Station 1–38, Cedros Island, Lower California, 17 July 1938, from under drifted kelp on gravel beach to north: 35 specimens.

The above specimens were borrowed by Mulaik, who described and illustrated them in 1960. I have not seen them, since efforts to have them returned to Washington have been unsuccessful.

Scyphacidae

Armadilloniscus holmesi Arcangeli

Armadilloniscus holmesi Arcangeli.—Mulaik, 1960: 135, pl. 6, figs. 93–105.—Schultz, 1972: 484, fig. 40 [synonymy].

Station 1–38, Cedros Island, Lower California, 17 July 1938, from under drifted kelp on gravel beach to north: 75 specimens.

The above specimens were borrowed by Mulaik and reported on by him in 1960. They have not yet been returned to the National Museum of Natural History.

Distribution: Friday Harbor, Washington, to Magdalena Bay, Lower California (Schultz, 1972).

Literature Cited

Barnard, K. H. 1914. Contributions to the crustacean fauna of South Africa. 3. Additions to the marine Isopoda, with notes on some previously incompletely known species. Ann. South African Mus. 10 (part 11, no. 16): 325a–442, pls. 27–38.

Brusca, Richard C. 1973. A handbook to the common intertidal invertebrates of the Gulf of California. Univ. Arizona Press, Tuscon, xvii + 427 pp.

Chilton, Charles. 1924. Fauna of the Chilka Lake. Tanaidacea and Isopoda. Mem. Indian Mus. 5 (12):875–895.

———. 1926. Zoological results of a tour in the far east. The Tanaidacea and Isopoda of Talé Sap. Rec. Indian Mus. 28 (3): 173–185.

Edmondson, Charles H. 1951. Some Central Pacific crustaceans. Occ. Pap. Bernice P. Bishop Mus., Honolulu 20 (13):183–243.

Glynn, Peter W. 1972. Isopoda of the Suez Canal. Israel Jour. Zool. 21:275–300.

Hansen, H. J. 1890. Cirolanidae et familiae nonnullae propinquae Musei Hauniensis. Vidensk. Selsk. Skr., 6 Raekke, Naturvidensk og Mathem. 5: 237–426, pls. 1–10.

Jones, David A. 1976. The systematics and ecology of some isopods of the genus *Cirolana* (Cirolanidae) from the Indian Ocean region. Jour. Zool., London 178:209–222.

Lemos de Castro, Alceu. 1964. *Trichorhina heterophthalma*, nueva especie de isópodo terrestre cavernicola de Cuba. Poeyana, ser. A, no. 2:1–7.

Menzies, Robert J. 1962. The zoogeography, ecology, and systematics of the Chilean marine isopods. Reports of the Lund University Chile Expedition 1948–49:42. Lunds Univ. Årsskr., N.F. Avd. 2, 57 (11):1–162.

———, and J. L. Barnard. 1959. Marine Isopoda on coastal shelf bottoms of southern California: systematics and ecology. Pacific Nat. 1 (11):1–35.

———, and Dirk Frankenberg. 1966. Handbook on the common marine isopod Crustacea of Georgia. University of Georgia Press, Athens, Ga., 93 pp.

———, and Peter W. Glynn. 1968. The common marine isopod Crustacea of Puerto Rico. Stud. Fauna Curaçao other Caribbean Is. 27 (104):1–133.

Miller, Milton A. 1968. Isopoda and Tanaidacea from buoys in coastal waters of the Continental United States, Hawaii, and the Bahamas (Crustacea). Proc. U.S. Nat. Mus. 125 (3652):1–53.

Monod, Théodore. 1931. Sur quelques Crustacés aquatiques d'Afrique (Cameroun et Congo). Rev. Zool. Bot. Africaines 21 (1):1–36.

———. 1933. Mission Robert-Ph. Dollfus en Egypte: Tanaidacea et Isopoda. Mém. Inst. Égypte 21:161–264.

———. 1937. Missions A. Gruvel dans le Canal de Suez. I. Crustacés. Mém. Inst. Égypte 34:1–19.

Moore, H. F. 1901. Report on Porto Rican Isopoda. Bull. U.S. Fish Comm. 20 (2):161–176, pls 7–11.

Moreira, Plínio Soares. 1972. Species of *Eurydice* (Isopoda, Flabellifera) from southern Brazil. Bolm. Inst. Oceanogr. São Paulo 21:69–91.

Mulaik, Stanley B. 1960. Contribucion al conocimiento de los isó-

podos terrestres de México (Isopoda, Oniscoidea). Rev. Soc. Mexicana Historia Natural 21 (1):79–292.

Nierstrasz, H. F. 1931. Die Isopoden der Siboga-Expedition. III. Isopoda Genuina. II. Flabellifera. Siboga-Exped. Monogr. 32 (c):123–232, pls. 10–11.

Nobili, Giuseppe. 1907. Ricerche sui crostacei della Polinesia. Decapodi, stomatopodi, anisopodi e isopodi. Mem. Accad. Sci. Torino (2) 57:351–430, pls. 1–3.

Richardson, Harriet. 1898. Description of four new species of *Rocinela*, with a synopsis of the genus. Proc. American Philos. Soc. 37 (157):8–17.

———. 1899a. Key to the isopods of the Pacific coast of North America, with descriptions of new and little-known species. Proc. U.S. Nat. Mus. 21 (1175):815–869.

———. 1889b. [reprinted under same title]. Ann. Mag. Nat. Hist. (7)4:157–187, 260–277, 321–338.

———. 1900. Synopses of North-American invertebrates. VIII. The Isopoda. American Nat. 34:207–230, 295–309.

———. 1901. Key to the isopods of the Atlantic coast of North America, with descriptions of new and little-known species. Proc. U.S. Nat. Mus. 23 (1222):493–579.

———. 1905. A monograph on the isopods of North America. Bull. U.S. Nat. Mus. 54:I–LIII + 1–727.

———. 1912. Marine and terrestrial isopods from Jamaica. Proc. U.S. Nat. Mus. 42 (1894): 187–194.

———. 1914. Reports on the scientific results of the expedition to the tropical Pacific, in charge of Alexander Agassiz, on the U.S. Fish Commission Steamer Albatross, from August, 1899, to March, 1900, Commander Jefferson F. Moser, U.S.N., commanding. XVII. Reports on the scientific results of the expedition to the eastern tropical Pacific in charge of Alexander Agassiz, by the U.S. Fish Commission steamer Albatross from October 1904 to March, 1905, Lieut. Commander L. M. Garrett, U.S.N., commanding. Bull. Mus. Comp. Zool., Harvard Univ. 58 (8):361–372.

Schioedte, J. C., and Fr. Meinert. 1879. Symbolae ad monographiam Cymothoarum Crustaceorum Isopodum familiae. 1. Aegidae. Naturhistorisk Tidsskrift (3) 12:321–414, pls. 7–13.

Schmitt, Waldo L. 1939. Decapoda and other Crustacea collected on the Presidential Cruise of 1938. Smithsonian Misc. Coll. 98 (6):1–29, pls. 1–3.

Schultz, George A. 1966. Marine isopods of the submarine canyons of the southern Californian continental shelf: systematics and distribution. Allan Hancock Pacific Exped. 27 (4):1–56.

———. 1969. How to know the marine isopod crustaceans. Wm. C. Brown Company Publishers, Dubuque, Iowa, vii + 359 pp.

———. 1972. A review of species of the family Scyphacidae in the

New World (Crustacea, Isopoda, Oniscoidea). Proc. Biol. Soc. Washington 84 (56):477–488.

Shoemaker, Clarence R. 1942. Amphipod crustaceans collected on the Presidential Cruise of 1938. Smithsonian Misc. Coll. 101 (11):1–31.

Stebbing, Thomas R. R. 1905. Report on the Isopoda collected by Professor Herdmann at Ceylon, in 1902. In: Report to the Government of Ceylon on the Pearl Oyster Fisheries in the Gulf of Manaar, by W. A. Herdmann. Part 4, Supplementary Report 23:1–64, pls. 1–12. Roy. Soc. London.

———. 1910. Reports on the marine biology of the Sudanese Red Sea. XIV. On the Crustacea Isopoda and Tanaidacea. Jour. Linnean Soc., Zool. 31:215–230, pls. 21–23.

Steinbeck, John, and Edward F. Ricketts. 1941. Sea of Cortez, a leisurely journal of travel and research, with a scientific appendix comprising materials for a source book on the marine animals of the Panamic faunal province. The Viking Press, New York, x + 598 pp.

Van Name, Willard G. 1936. The American land and fresh-water isopod Crustacea. Bull. American Mus. Nat. Hist. 71:i–vii + 1–535.